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CODE FOR HYGIENIC CONDITIONS FOR SOFT DRINK MANUFACTURING UNITS

(Incorporating Amendment No. 1)

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CODE FOR HYGIENIC CONDITIONS FOR SOFT DRINK MANUFACTURING UNITS

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CODE FOR HYGIENIC CONDITIONS FOR SOFT DRINK MANUFACTURING UNITS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 November 1970, after the draft finalized by the Food Hygiene, Sampling and Analysis Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 Consumers do not have the available knowledge or means of determining the hygienic quality of the food they purchase. For this, they rely on the hygienic standards of various industries that prepare and handle foods. This code has been prepared keeping in view that unless the factory producing the food is governed by a strict hygienic code in respect of layout, plant and personnel, the quality of the food produced cannot be considered as safe.

0.3 This code is being issued in order to determine whether the facilities, methods, practices and controls used in the manufacturing of soft drinks are in conformity with good manufacturing practices. It is necessary to ensure that soft drink for human consumption is safe and has been prepared, packed and stored under hygienic conditions.

0.4 This code is an adjunct to IS : 2491-1963*, and it covers requirements specific to the large scale soft drinks manufacturing units. However, the basic principles of hygiene underlining the technical advice in this code should be applied with appropriate modifications to all soft drinks manufacturing units.

0.5 This code is subject to the provisions in the Factories Act, 1948 and the Prevention of Food Adulteration Act, 1954, and the Rules framed thereunder, amended up to date.

0.6 This edition 1.1 incorporates Amendment No. 1 (May 1984). Side bar indicates modification of the text as the result of incorporation of the amendment.

1. SCOPE

1.1 This code prescribes the hygienic conditions required for establishing and maintaining manufacturing units for soft drinks.

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*Code for sanitary conditions for food processing units.

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2. SITE

2.1 A soft drink manufacturing unit shall be situated in an open, clean and healthy surroundings far away from cattle sheds, open sewage drains or other places likely to breed flies. Premises shall not have objectionable odour or smoke. There shall not be accumulation of trash, garbage or similar wastes in the vicinity of the plant.

3. BUILDING

3.1 Structure shall be of permanent nature and shall be suitable in size, construction and design to facilitate maintenance and sanitary operations for processing purposes. It should provide sufficient space for housing of equipment and storage of materials as is necessary for sanitary operations. The material of construction shall be of brick, plaster, cement, concrete, tile or any other equivalent materials which ensures cleanliness. The construction of the building shall be such that it should be rodent-proof, fly proof and bird-proof.

3.2 No portion of building shall be used for domestic purposes or other types of food preparations unless separated by suitable partitions or locations or other effective means so as to avoid contamination of the product with undesirable micro-organisms, odour, chemicals, filth or other foreign material.

3.3 Separate rooms of sufficient size should be provided for manufacture and storage of soft drink washing and sanitization of containers and utensils, and storage of raw materials and other requisites.

3.4 Floors — The floor of areas where ingredients are handled, compounded, mixed or processed (flavour room, syrup room and bottling area) or where containers or equipment are washed shall be constructed of impervious and easily cleanable smooth material. It shall not be affected by weak acids, alkalis or steam. The floors shall be properly sloped and shall be provided with trap drains which shall be prevented from clogging. The floors shall be kept clean and in good repairs.

3.5 Walls and Ceilings — Internal walls and units should have smooth, non-absorbent light-coloured surface, free from crevices and sharp angles, to facilitate their efficient cleaning. The walls in the flavour room, syrup room, washing area, bottling or packaging area shall have tiling up to the height reached by splash or water spray. The interior walls of storage areas may be of good construction material.

3.6 Doors and Windows — Flavour room, syrup room, filling area shall be provided with effective means to prevent entry of flies and insects. Such effective means may be screens, fans, etc. Windows in this area shall be glazed. Doors in syrup room and toilet room shall be self-closing. The doors and windows shall open outwards.

3.7 Lighting and Ventilation — Manufacturing and storage shall be well lighted and ventilated. The light source may be natural, artificial or a combination of both, and should furnish illumination of at least 250 lux in all working areas. Artificial lights in syrup room, flavour room and filling area shall have protective shield. The ventilation shall be adequate to prevent any reasonable excessive condensation on equipment and walls of buildings. Pressurized ventilating system, if used, shall have clean air intake. Ventilation and lighting shall be also in accordance with the Factories Act, 1948. amended uptodate.

3.8 Maintenance and Repairs — The building shall be maintained in a proper state of repair and cleanliness. Whenever required, it shall be lime-washed, painted, disinfected and deodorized.

4. FACTORY AND PROCESSING HYGIENE

4.1 Bottle Washing — All bottles shall be thoroughly cleaned and sanitized immediately before filling. In large units, this may be accomplished by means of automatic mechanical washing machines having arrangements for pre-rinse caustic jet and soaking or both, and final rinse. In small units the bottle washer should have arrangements for pre-rinse, soaking tank and final rinse.

4.1.1 All the bottles shall be exposed to a minimum of 3 percent alkali solution of which not less than 60 percent is caustic (sodium hydroxide), for a period of not less than 5 minutes at a temperature of not less than 55°C (*see also* **4.1.2**). The water used for final rinse shall be of potable quality; otherwise it shall be chlorinated and shall have 0.5 to 1.0 ppm residual chlorine. The residual chlorine shall be determined by the colour comparison method using *o*-tolidine solution (*see* **22** of IS : 3550-1965*). After the final rinse, it shall be ensured that the bottles are free from any caustic residue; it can be detected by testing the rinse of the bottles with phenolphthalein indicator solution which turns pink in presence of alkali.

4.1.2 Bottle washing may be accomplished by any other chemical agent which would ensure equivalent cleaning and sanitizing described in **4.1.1**.

4.1.3 The effectiveness of sanitization of the bottles shall be periodically checked by the method described in **5** of IS : 1479 (Part V)-1962†.

4.2 Filling and Sealing — Product containers shall be filled and sealed in a hygienic manner. In case of large scale units, the filling and sealing shall be carried out by automatic filler and sealer. In small scale units the filling and sealing may be carried out by hand filler and sealer. Beverage falling on the floor due to over-filling or breakage of the bottles shall be immediately cleaned with water. Personnel involved in filling and sealing shall observe good house-keeping practices so as not to contaminate the product during this operation.

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*Methods of test for routine control of water used in industry.

†Methods of test for dairy industry: Part V Methods of dairy plant control.

4.3 Syrup Handling Equipment — All syrup handling equipment like syrup tanks, pipe lines, filter press, plate coolers, etc, shall be constructed of a suitable non-corrosive material, preferably stainless steel. These equipment shall not contribute metallic ions in the beverage in excess of standards prescribed for potable drinking water. The syrup tanks should have mechanical agitation facilities for mixing purpose and shall be provided with cover or lid. The construction of the equipment shall be such that all the surfaces are easily accessible for proper cleaning and sanitizing operations.

4.4 Filling Area and Syrup Room — The filling area and syrup room shall be separated from other areas of plant like storage area of bottles, crowns, chemicals, etc. Both these areas shall have adequate ventilation and lighting facilities. Also the entry of flies, insects and dust shall be prevented by suitable means.

4.5 Waste and rubbish shall be collected in covered receptacles and shall not be allowed to lie about on the floor.

4.6 Adequate measures shall be taken to prevent growth of mould on equipment and internal structures of processing and storage rooms.

4.6.1 Adequate steps shall be taken to prevent infestation of cockroaches and other household pests.

4.7 When pesticides and disinfectants or both are used, care shall be exercised to prevent contamination of equipment, raw materials and packing materials. Under no circumstances shall pesticides be used during processing.

4.8 Floors and drains shall be kept clean. In the processing room, drains shall be provided with detachable covers.

4.9 Sinks and troughs used for washing ingredients and utensils shall not be used for washing of hands.

4.10 No lavatory, sink, cesspool, or garbage shall be so situated or maintained that odours or fumes therefrom pervade any room where the product or raw materials are prepared or stored.

4.11 The factory effluents shall be disposed of in a hygienic manner and shall not be let off on road on adjacent fields.

4.12 Window glass and light fittings shall be maintained clean and dust-free at all times.

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4.13 There shall be no cob-webs in any part of the unit. Birds and domestic animals shall not be allowed in any part of the unit.

5. EQUIPMENT AND CONTAINER CLEANLINESS

5.1 Construction of Equipment — All the equipment, piping and utensils used in the manufacturing shall be smooth, impervious, corrosion resistant, non-toxic and in good condition. All these equipment shall be constructed so that the sanitation of all the parts that come in contact with the material may be ensured. All the weldings shall be ground smooth. Dead ends in the pipe lines shall be avoided and joints shall be flush.

5.2 Cleaning and Sanitation of the Equipment — All the equipment used in the manufacturing shall be thoroughly cleaned immediately after use and shall be sanitized with steam, chlorine solution (available chlorine 50 ppm) or any approved bactericidal process prior to use. Equipment, pipe lines, etc, shall have no residue of cleaning or sanitizing agent after sanitizing. The cleaning or sanitizing agents used in the plant shall have the labels to identify the contents and shall be properly stored when not in use.

5.2.1 The entire processing system shall be flushed out prior to its use again.

6. WATER SUPPLY

6.1 There shall be an adequate supply of safe and potable water (*see* IS : 4251-1967*). Running water under pressure shall be easily accessible to all rooms and areas in which syrup and beverages are prepared and equipment are washed.

6.2 The equipment shall be so installed and used that back siphonage of liquid into the potable water lines is precluded.

6.3 Hot or cold water in ample supply shall be provided for plant clean-up needs, where necessary.

6.4 The storage tanks for water should, unless completely sealed, be kept covered with tight fitting lids, examined regularly and cleaned out at least once every six months.

6.5 The water shall be periodically examined chemically and bacteriologically, A record of such examination shall be maintained.

7. EMPLOYEE HYGIENE

7.1 Every person employed in the factory shall be medically examined by an authorized registered medical practitioner and the examination shall

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*Quality tolerances for water for processed food industry.

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include X-ray of the chest for tuberculosis. The examination shall also include: examination of stool for protozoal and helminthic infestation for those parasites which are transmitted by ingestion and for the presence of *Salmonella, Shigella* species and *Vibrio cholerae* . Subsequently, the employee shall be medically examined once in a year or more frequently, if necessary, to ensure that he is medically fit and free from communicable diseases.

7.1.1 It shall be impressed on all employees that they should notify the medical officer or management, cases of fever, vomitting, diarrhoea, typhoid, dysentery, boils, cuts and sores and ulcers (however small), and notifiable diseases occurring in their own homes and families.

7.1.2 No worker who is suspected to be suffering from any of the disorders listed in **7.1.1** shall be permitted to work inside the unit.

7.2 Employees shall keep their finger nails short and clean and wash their hands with soap or detergent before commencing work and after each absence, specially after using sanitary conveniences. Towels used for drying hands should be clean. No worker shall allow his hands or any part of his body or clothing to come into contact with the soft drink. He should adopt strict hygienic practices so as to avoid adding any microbial contamination to the material.

7.3 All employees shall be inoculated against typhoid and paratyphoid A diseases on their first appointment and thereafter, once in every five years. In case of epidemic, all workers shall be inoculated. A record shall be maintained.

7.4 No worker shall be allowed to work without proper clothing.

7.5 Employees shall be provided with clean uniforms (preferably white) or aprons or both and clean washable caps, where necessary.

7.5.1 The uniforms shall not be worn outside the plant but put on just before starting the work and changed when leaving.

7.6 Eating, spitting, nose cleaning or the use of tobacco in any form or chewing betel leaves shall be prohibited within the manufacturing, packing and storage area of the unit. Notice to this effect shall be prominently displayed and enforced.

7.7 Sufficient and suitable sanitary conveniences shall be provided, maintained and kept clean in every factory. The conveniences shall be properly lighted. Separate conveniences shall be provided for each sex. No convenience shall open directly into any work room in the factory. The conveniences shall always be maintained clean and in good repairs.

7.8 Sufficient number of wash basins with adequate provision of soap and towels, latrines and urinals in the prescribed manner should be provided, conveniently situated and accessible to workers at all times while they are at the factory.

8. HYGIENIC QUALITY OF INGREDIENTS

8.1 Water that goes into the final product shall be free from pathogenic organisms, potable and should meet quality tolerances for water for processed food industry (*see* IS : 4251-1967*).

8.2 The sugar should be free from pathogenic organisms and the prepared syrup shall be treated at minimum temperature of 85°C for 30 minutes.

8.3 Carbon dioxide should be free from pathogenic organisms and should have minimum of 99 percent purity.

8.4 Flavours, colours and other chemicals shall be used in accordance with the Preservation of Food Adulteration Rules. They shall be properly treated, if required, to ensure that they are free from pathogenic micro-organisms.

9. STORAGE

9.1 Store Rooms — The store rooms for raw and packing materials should be free from dampness and should be rodent-proof.

9.2 Wherever possible a separate room for storing machinery, equipment, spare parts, pesticides, etc, shall be provided in a location convenient to various preparation and processing areas.

9.3 Proper places shall be provided for storage of brooms, brushes, buckets and other cleaning gear.

9.4 Raw materials, crown corks and chemicals, etc, shall be stored separately in their original packings on skid platforms. Active supply of ingredients and chemicals may be maintained in suitable bins having lids or covers.

9.4.1 All the containers of chemicals shall have the names of chemicals clearly mentioned on them.

9.4.2 No chemicals other than those required during manufacture of soft drinks shall be stored in the manufacturing unit.

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*Quality tolerances for water for processed food industry.

10. CROWN CORKS

10.1 Crown corks shall be purchased from those manufacturers who adopt measures to prevent microbial contamination during manufacture, transport and storage.

10.1.1 The crown corks shall be suitably packed in hygienic manner in cardboard or wooden boxes.

10.2 Crown corks should be kept clean and free from contamination before use, preferably by the use of water-proof and dust-proof packaging. The handling and storage of crown corks should be such as to prevent contamination.

10.3 Crown corks once used shall not be reused.

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